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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/059,168

01/31/2002

Akiya Nakayama

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10/08/2004

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EXAMINER

NGUYEN, KHIEM D

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 10/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/059,168

Applicant(s)

NAKAYMA ET AL.

Examiner

Khiem D Nguyen

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2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 10-15 is/are rejected.
- 7) ☒ Claim(s) 8 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

HSIEN-MING LEE  
PRIMARY EXAMINER

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

10/7/2004

### **DETAILED ACTION**

The non-final rejection as set forth in paper No. (042304) is withdrawn in response to applicant's amendments. A new rejection is made as set forth in this Office Action. Claims (1-15) are pending in the application.

#### ***Claim Objections***

Claim 12 is objected to because of the following informalities: In claim 12, it is unclear whether the Applicants intended to treat this claim as an independent or a dependent claim. If it were an independent claim, the claim body should have a completed processing steps, instead of reciting "by the process according to claim 1". Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claim 6 recites the limitation "~~the apexes of hills~~" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

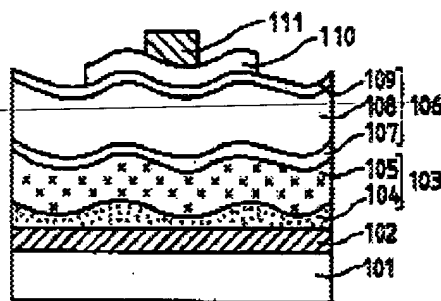
Claims 1-7 and 10-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakayama (U.S. Patent 5,620,530).

In re claim 1, Nakayama discloses a process for forming on a substrate **101** a transparent conductive film **103** having crystallizability, the process comprising: a first step of forming a film **104** at a first film formation rate; and a second step forming a film **105** at a second film formation rate; the relationship between film formation rates in the respective steps satisfying:  $2 \leq (\text{second film formation rate } 105) / (\text{first film formation rate } 104) \leq 100$  (col. 5, line 25 to col. 6, line 58 and FIGS. 1B-C).

FIG. 1B



FIG. 1C



In re claim 2, Nakayama discloses wherein, in the first step, nuclei are formed on the substrate **101**, and, in the second step, the film **105** is so formed as to cover the substrate surface and the surfaces of the nuclei over their whole area (col. 20, line 54 to col. 22, line 37 and FIGS. 1-2).

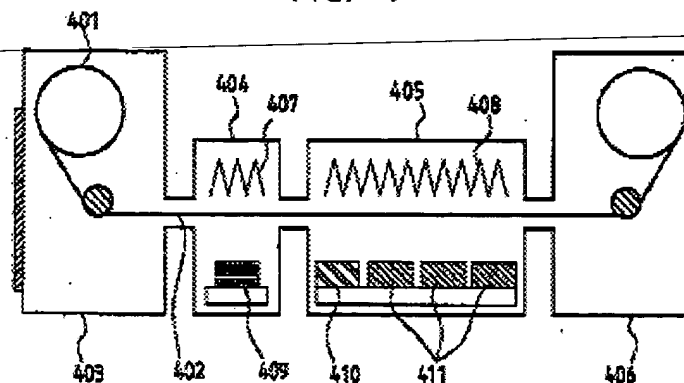
In re claim 3, Nakayama discloses wherein, in the first step, the film **104** is formed in a thickness of from 5 nm to 20 nm (col. 3, lines 31-54).

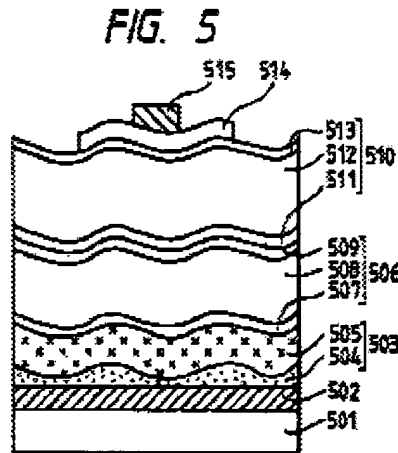
In re claims 4 and 5, Nakayama discloses wherein, in the second step, the film **105** is formed in a thickness of 5 $\mu$ m or less (col. 3, lines 31-54 and **FIG. 1B**).

In re claim 6, Nakayama discloses wherein, in the first step, the first step is carried out such that the average distance between the apexes of hills themselves of the film formed in the first step and the average distance between the apexes of hills of the film formed in the first step and the substrate surface are in a ratio of from 1: 3 to 4: 1 (col. 5, line 25 to col. 6, line 58 and **FIGS. 1B-C**).

In re claim 7, Nakayama discloses wherein the transparent conductive film **103** is formed by a roll-to-roll method in which a continuous substrate **101** is put across rollers and transported therebetween (col. 13, lines 30-54 and **FIGS. 4-5**).

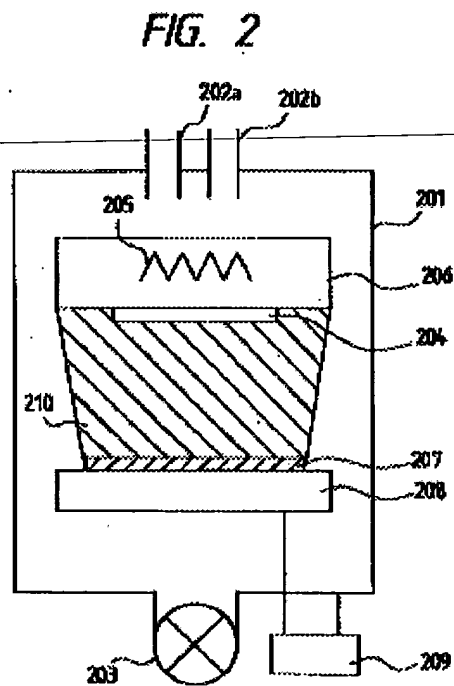
**FIG. 4**





In re claim 10, Nakayama discloses wherein the transparent conductive film 103 is formed by sputtering (col. 3, lines 21-30).

In re claim 11, Nakayama discloses wherein, in the second step, a target having been subjected to pre-sputtering is used (col. 5, line 43 to col. 6, line 4 and **FIG. 2**).



In re claim 12, Nakayama discloses wherein a process for producing a photovoltaic device; the process comprising the steps of: forming a transparent conductive film 103 by the process according to claim 1; and forming a semiconductor layer 106 (col. 5, lines 19-42, col. 6, lines 18-38 and FIG. 1C).

In re claim 13, Nakayama discloses wherein a transparent conductive film 103 formed by the process according to claim 1 (col. 5, line 25 to col. 6, line 58 and FIGS. 1B-C).

In re claim 14, Nakayama discloses wherein a photovoltaic device comprising a transparent conductive film 103 formed by the process according to claim 1 (col. 5, lines 19-42, col. 6, lines 18-38 and FIG. 1C).

In re claim 15, Nakayama discloses wherein the transparent conductive film 103 comprises zinc oxide, tin oxide, indium oxide, titanium oxide, or a composite of any of these oxides (col. 5, lines 34-42).

#### ***Allowable Subject Matter***

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Claims 8-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Reasons For Allowance***

The following is a statement of reasons for the indication of allowable subject matter: The prior art taken alone or in combination neither discloses nor makes obvious the instant process of claims as a whole. Specifically, the prior art of record, Nakayama (U.S. Patent 5,620,530) fails to teach or suggest the Applicant's steps of after the second

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step, a third step of forming a transparent conductive film at a third film formation rate wherein the relationship between film formation rates in the respective steps satisfies:  $2 \leq (\text{third film formation rate})/(\text{first film formation rate}) < 100$ ; and (second film formation rate)  $> (\text{third film formation rate})$  as recited in the currently amended dependent claim 8, lines 2-7).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (571) 272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K.N.  
October 6<sup>th</sup>, 2004

HSIEN-MING LEE  
PRIMARY EXAMINER

*lee*  
10/7/2004